

21st the stage was 20.1 feet, and the river rose steadily until the 29th, when a crest stage of 28 feet was reached. Since then the flood has been gradually receding, but the stage of the river is still high, being 25.8 feet to-day—April 5. All bottom lands in this vicinity are under water. The cellars of many stores and warehouses are flooded, but most of the goods contained in these were saved, on account of the timely warnings issued by the Weather Bureau. The high water has interfered with the operations of several manufactories. During the crest stage, the roadbed of the Interurban Railway was flooded in places to a depth of a few inches. The total damage done in this vicinity will amount to several thousand dollars.

TORNADO IN SOUTHERN ILLINOIS.

By Prof. F. H. COLYER, Cooperative Observer, Carbondale, Ill.

On the evening of March 24 a tornado occurred in the vicinity of Makanda, Ill. The storm began about 7.10 p. m., $2\frac{1}{2}$ miles west of Makanda, and moved almost directly northeast, the destructive part extending over a track about 25 miles long. The end of the destructive path was reached at 7.30 p. m., thus the forward movement of the storm was at the rate of 75 miles an hour. Although it was dark, many persons saw a well developed funnel cloud, because of the almost continuous lightning. Those who live near the edge of the storm's path say the funnel cloud was well marked, and that it rose and fell, as well as pitched from side to side, as it proceeded. For several hours preceding the storm's approach the clouds at Carbondale, Ill., showed rather remarkable conditions. Some moved from the southwest, others from the northwest, and still others from various directions. The temperature fluctuated rapidly, warm southwest winds at a temperature of 75° being replaced quickly by cold puffs from the northwest. Several of these periods occurred in the afternoon of the day of the storm.

On the north side of the storm's path trees were blown down so as to lie to the southeast, except where they were carried bodily into the whirl and dropped on its outer edge. On the south side they were generally thrown to the northeast. In the path of the greatest destruction the trees were thrown in all directions.

The width of the destructive path varied. At the point where an Illinois Central freight train was struck, 21 cars were blown out of a train of 41 cars. The engine and tender were left on the track at one end, and 20 cars at the other end. Ten of the 21 cars blown off the track were almost completely destroyed. The damage to this train is estimated at about \$17,500. The damage to farmers who were in the track of the storm was about \$30,000. Thirty-nine farmers sustained the loss of either the house or barn, or both.

Three persons were killed, and 10 injured. A number of persons escaped by going to basements or by crouching down by iron bedsteads, trunks, etc.

STORMS IN ILLINOIS—MARCH, 1913.

By C. J. Root, Section Director.

Severe local storms were reported on the 13th in La Salle County and at a number of places in west-central Illinois. Considerable damage from wind and lightning resulted to buildings and electrical equipment. Charles Gilpin, a farmer living near Jacksonville, was killed by a falling tree.

An ice and wind storm on the night of the 20th–21st in the northern third of the State caused considerable dam-

age to electrical services. Poles and wires were down in many sections, and wire service was poor for almost a week.

In the late evening of March 23 and early morning of the 24th severe windstorms visited many sections of the northern end of the State, the affected area extending from the Mississippi River to Lake Michigan. Similar storms were reported in Fulton and Christian Counties. While these storms were severe and destructive, there is little evidence of tornadic action. The losses were principally to barns, outbuildings, haystacks, fences, trees, and wires and poles, but damage to houses and substantial structures was reported in a number of places. At Des Plaines, near Chicago, two trainmen were killed when a chimney fell onto the caboose of a freight train passing through the town. At Erie a young woman was killed in the collapse of a house.

STORM OF MARCH 23, 1913, AT DAVENPORT, IOWA.

By J. M. SHERIER, Local Forecaster.

At 11.30 p. m. of March 23, 1913, this section was visited by the most destructive windstorm of recent years. The barometer, which had been falling steadily during the preceding 36 hours, reached its lowest point, 29.43 inches, reduced to sea level, at midnight of the 23d–24th. The temperature had risen from 34° at 7 a. m. to 66° at 11 p. m., and the conditions were oppressive during the evening and before 11.25 p. m., notwithstanding the fact that the wind increased after sunset and frequently exceeded a rate of 30 miles per hour after 7.30 p. m. Clouds had covered the sky until nearly 8 p. m., with rain from during night (a. m.) to 1.25 p. m., and a light thunderstorm from 4.44 p. m. to 7.23 p. m. Partly cloudy weather prevailed from 8 p. m. to 9 p. m., after which time it was again generally cloudy. At 10 p. m. heavy stratus clouds were observed coming from the southwest, which overspread all except the southern third of the sky by the time the opposite horizon had been reached. In addition to their progressive motion from the southwest, there was a tumultuous movement on the part of the swiftly moving fracto-stratus clouds that suggested the wave motion of a large body of water. Until 10.45 p. m. a remarkably even border was maintained along the southern edge of the field of lower clouds, beyond which only occasional fracto-cumulus clouds were seen to go.

South of this border, and especially in the vicinity of the moon, the light cirro-stratus clouds had a greenish-yellow color, resembling that of cheese. Shortly after 11 p. m. the sky became entirely overcast, but there was at no time any formation that indicated the presence of a vortex, though the pitching motion, already mentioned, was particularly marked between 11.30 p. m. and midnight. At 11.25 p. m. the wind suddenly increased in force, reaching an extreme velocity of 60 miles per hour 5 minutes later and maintaining an average velocity of 48 miles per hour from 11.26 p. m. to 11.31 p. m., after which time the rate of movement decreased. A second furious squall began at 12.05 a. m. of the 24th and lasted until 12.30 a. m., with an extreme velocity of 42 miles per hour at 12.07 a. m. When the wind was highest it appeared to come in a rapid succession of gusts and to have an unusual upward force, causing in houses of ordinary construction a vibration similar to that imparted to a vessel by the motion of its screw. At the time of the highest velocity the wind was fairly steady from the southwest and was at all times from some point in the quadrant from south to west. All wreckage, so far as observations extend, was carried to the eastward of its original position.

Light rain began at 11.10 p. m. and ended after midnight of the 23d-24th. A heavy dash of rain occurred from 11.35 p. m. to 11.42 p. m. and was mixed with hail, ranging in size from about 0.2 inch to 0.4 inch in diameter, from 11.40 to 11.42. On account of the danger of freezing temperatures, the tipping bucket had been removed from the self-registering rain gage and the exact rate of rainfall could not be determined. The total precipitation between 7 p. m. of the 23d and 7 a. m. of the 24th, however, was but 0.12 inch. The first thunder was heard at 11.35 p. m. of the 23d and the last thunder occurred about 1 a. m. of the 24th. The lightning was most vivid about 11.45 p. m., but not especially close. Aside from the roar of the wind and the hissing of the rain and hail, no unusual noises were noticed.

On the morning of the 24th it was found that all surfaces upon which the rain had dried contained a light deposit of soil, which appeared to be yellow clay and which was unlike the surface soil in this vicinity. In the depressions of the metal roof of the Masonic Temple, a building five stories in height, the deposit of mud was so thick that it curled along the edges of the tiny puddles as the water evaporated. Numerous reports of the same muddy rain water have been received from Rock Island and Moline, Ill.

In the western portion of the city, three large iron smokestacks at the plant of the Corn Products Refining Co. were blown down, causing a loss of about \$5,000. The Davenport Locomotive Works also lost three smokestacks, and it will cost approximately \$3,500 to repair the damage at that factory. Two large smokestacks were thrown down at the wheel and wagon works of Messrs. French & Hecht, a few blocks east of the station, damaging the roof of one of the buildings. The roof of the elevator shaft was also twisted from its position by the wind, without being carried away. The actual property loss at that point was about \$5,000, but the factory was forced to close, and the loss incident to the suspension of operations will be several times the amount already named. The tin roof of the building occupied by the Peter Lamp Iron Co., in the center of the business district, was torn away, causing a loss of about \$1,000. Two

large plate-glass windows in the New Putnam Building, valued at \$400, were demolished; and in various portions of the city smaller windows were blown in, chimneys were thrown down, and roofs were damaged to some extent. Farm houses and outbuildings were damaged or destroyed at numerous places throughout the surrounding country; and, in some instances, stock was killed. The total damage in this locality is estimated to be about \$30,000. On account of the sheltering bluffs to the southward, no serious loss occurred in the cities of Rock Island and Moline, Ill. Telegraph and telephone wires were prostrated in all directions, however, and it was late in the forenoon of the 24th before communication with outside points could be resumed.

Miss Lulu Ellison was killed near Erie, Ill., a small town about 25 miles northeast of Davenport, when the house in which she was asleep collapsed. Mr. Harry Brown, of Davenport, was struck by flying boards and injured, though not seriously.

ERRATA.

Report for January, 1913.—Charles City, Iowa: Precipitation on 5th published 0.05 should be 0.04; total precipitation for month published 0.28 should be 0.27; departure of the monthly precipitation from the normal published -0.69 should be -0.70.

Report for February, 1913.—Caledonia, Minn.: Number of clear days published 14 should be 15; number of cloudy days published 11 should be 10. Keokuk, Iowa: Highest temperature on 11th published 28 should be 34; lowest temperature on 20th published 31 should be 30; mean highest temperature published 34 should be 34.2; mean monthly temperature published 25.2 should be 25.4; departure of the mean monthly temperature from the normal published -1.4 should be -1.2; greatest 24-hour precipitation published 0.99 should be 1.29. La Salle, Ill.: Greatest 24-hour precipitation published 1.70 should be 1.80. State sanatorium, Minn.: Mean monthly temperature published 5.8 should be 5.4. Weyerhaeuser, Wis.: Mean minimum temperature published -3.5 should be -3.9.